

# Appalachian Stream Mitigation Workshop: Off-Site Mitigation Options – Kentucky In-Lieu Fee Program

Patricia A. Grace-Jarrett, Ph. D.

Senior Project Manager

Louisville District

April 15, 2011



US Army Corps of Engineers  
**BUILDING STRONG**

4/29/2004 9:27am

# Off-Site Mitigation Options – KY ILF Program

- History, Overview
- Compensation for Impacts in the Appalachian Region
- Existing Challenges
- Compliance with the Mitigation Rule
  - New Elements
  - Transition Issues



# Off-Site Mitigation Options – KY ILF Program

## History, Overview

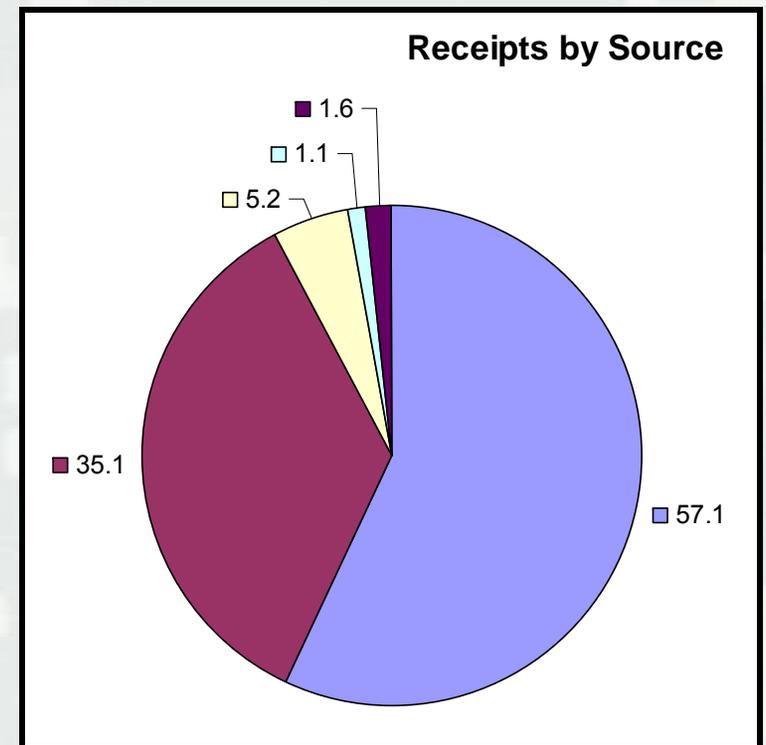


---

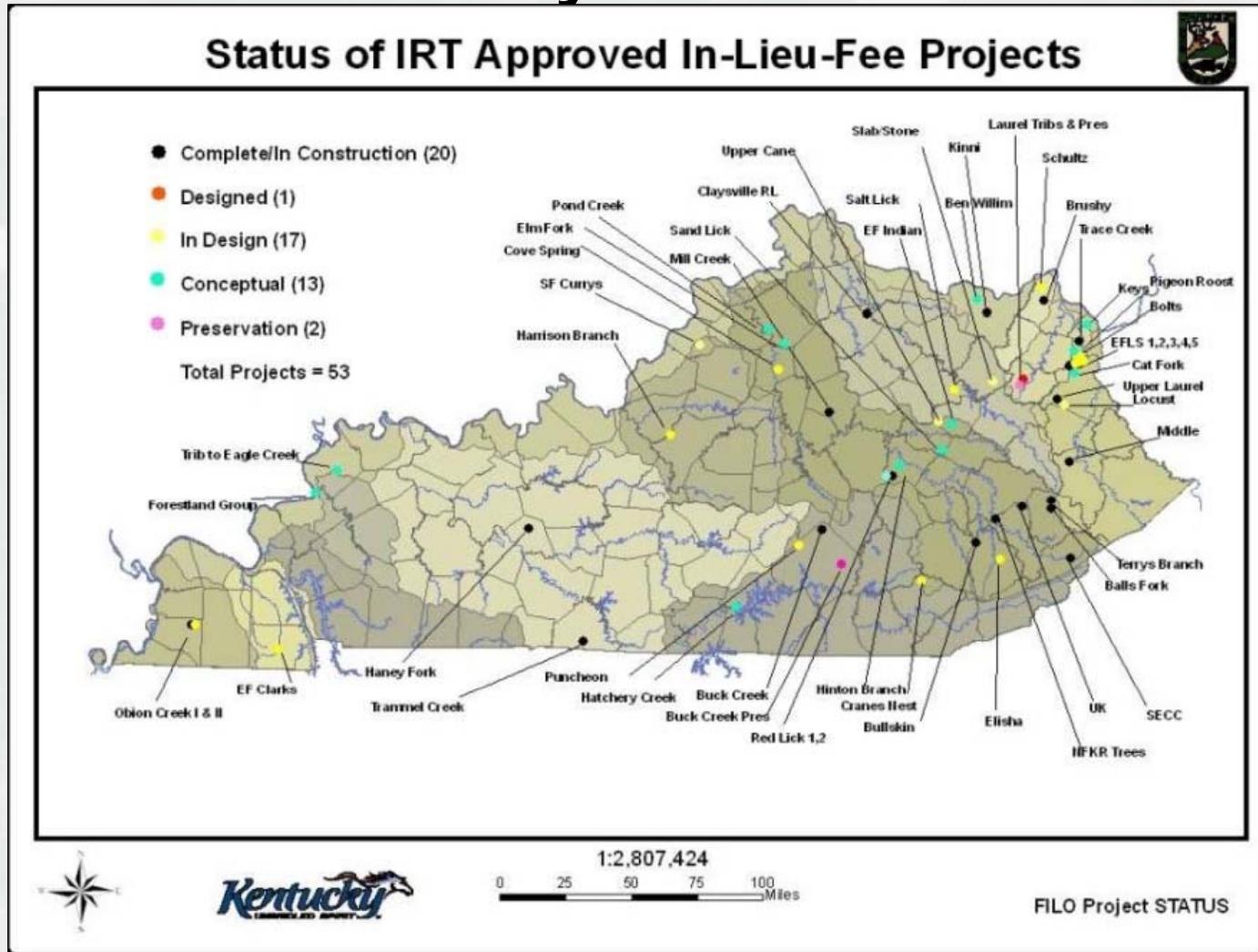
**BUILDING STRONG®**

# Off-Site Mitigation Options – KY ILF Program: History/Overview

- \$77 M 2002 - present
- 440,000 linear feet of stream mitigation
- 55 projects statewide
- Payments (overall):
  - ▶ ~ 60% for KYTC
  - ▶ ~ 30% for mining industry



# Off-Site Mitigation Options – KY ILF Program: History/Overview



# Off-Site Mitigation Options – KY ILF Program

## Compensation for Impacts in the Appalachian Region

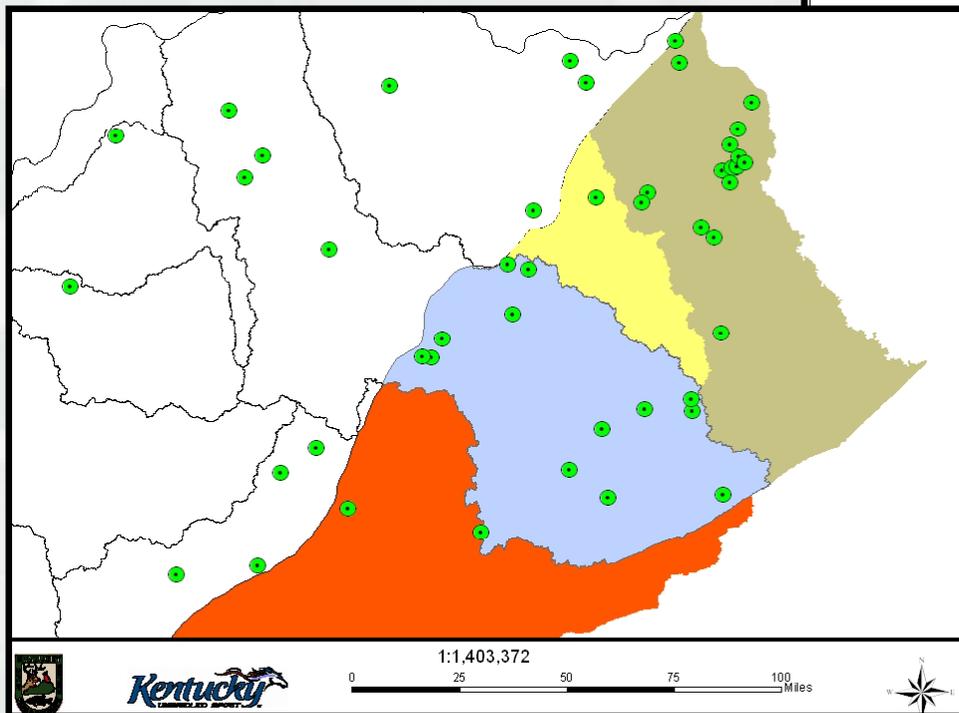
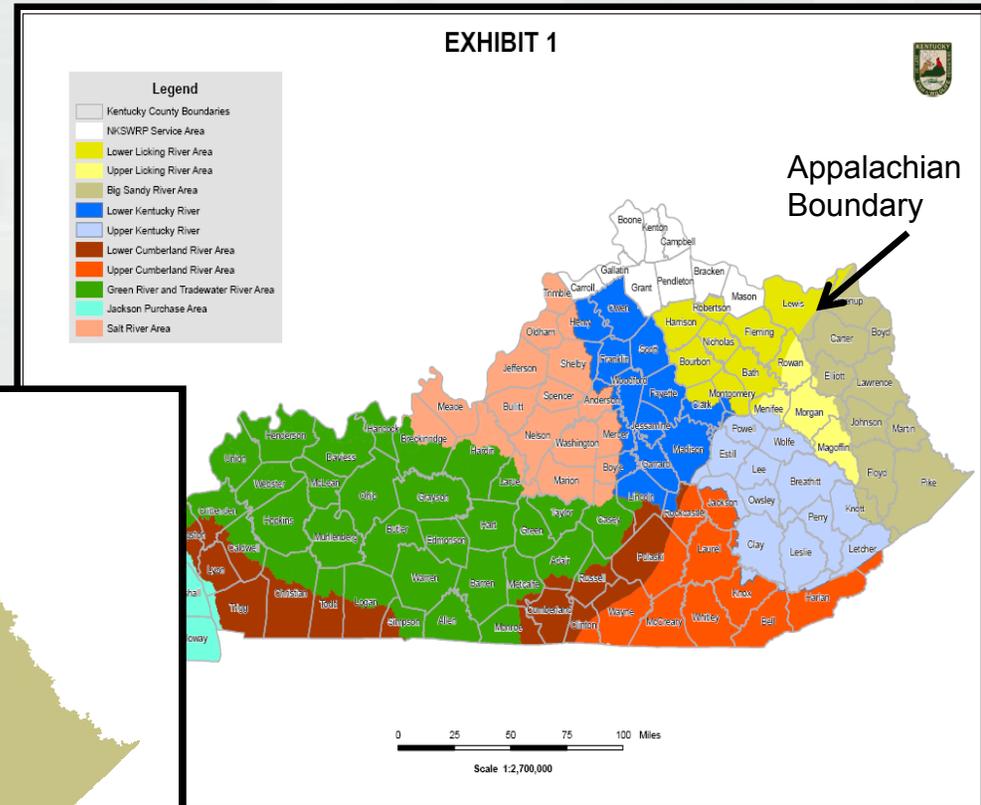


---

**BUILDING STRONG®**

# Off-Site Mitigation Options – KY ILF Program: Compensation in Appalachia

60% projects in  
Appalachian  
Region



**BUILDING STRONG®**

# Terry's Branch

## Kentucky River



- 3,000 LF Stream Re-establishment & Enhancement & 1.5 acres Wetland Re-establishment
- 5.0 Acres Riparian Forest
- Heterogeneous in-stream habitat



# Laurel Gorge

## Big Sandy River



**BUILDING STRONG®**

# Mill Creek Kentucky River



- 700 LF Stream Re-establishment, Wetland Re-establishment
- Aquifer reconstruction
- Denitrification System
- Educational Outreach



# Off-Site Mitigation Options – KY ILF Program

## Existing Challenges

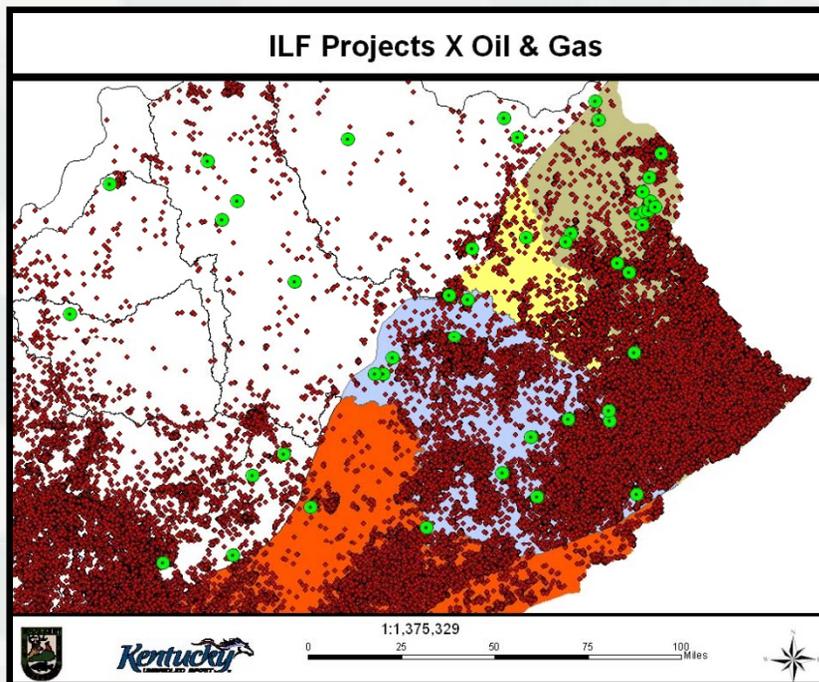


---

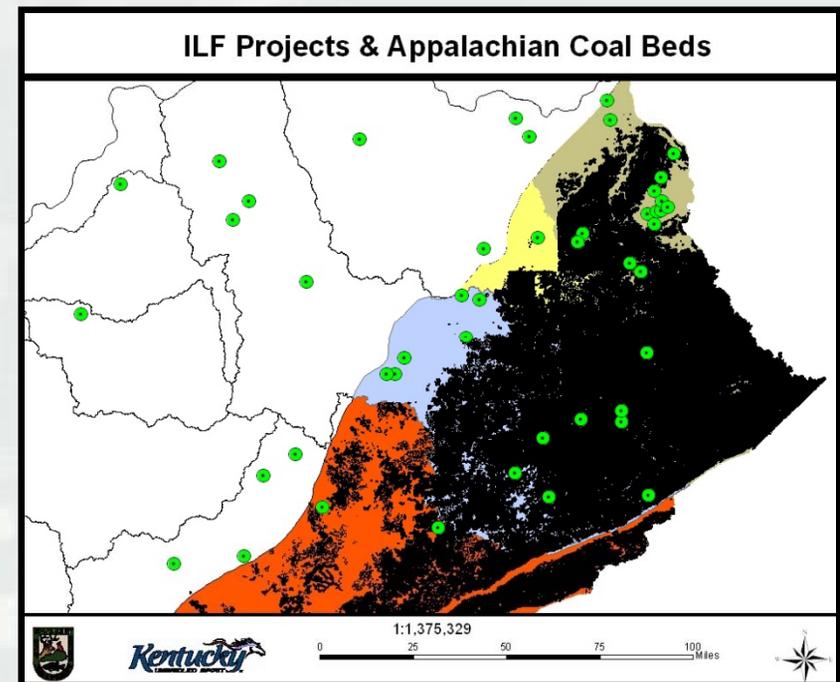
**BUILDING STRONG®**

# Off-Site Mitigation Options – KY ILF Program: Challenges

- Site Selection



- Site Protection



- Multiple Property Owners



BUILDING STRONG®

# Off-Site Mitigation Options – KY ILF Program

## Compliance with the Mitigation Rule

- New Elements
- Transition Issues



---

**BUILDING STRONG®**

# Off-Site Mitigation Options – KY ILF Program

## Compliance with the Mitigation Rule

- New Elements

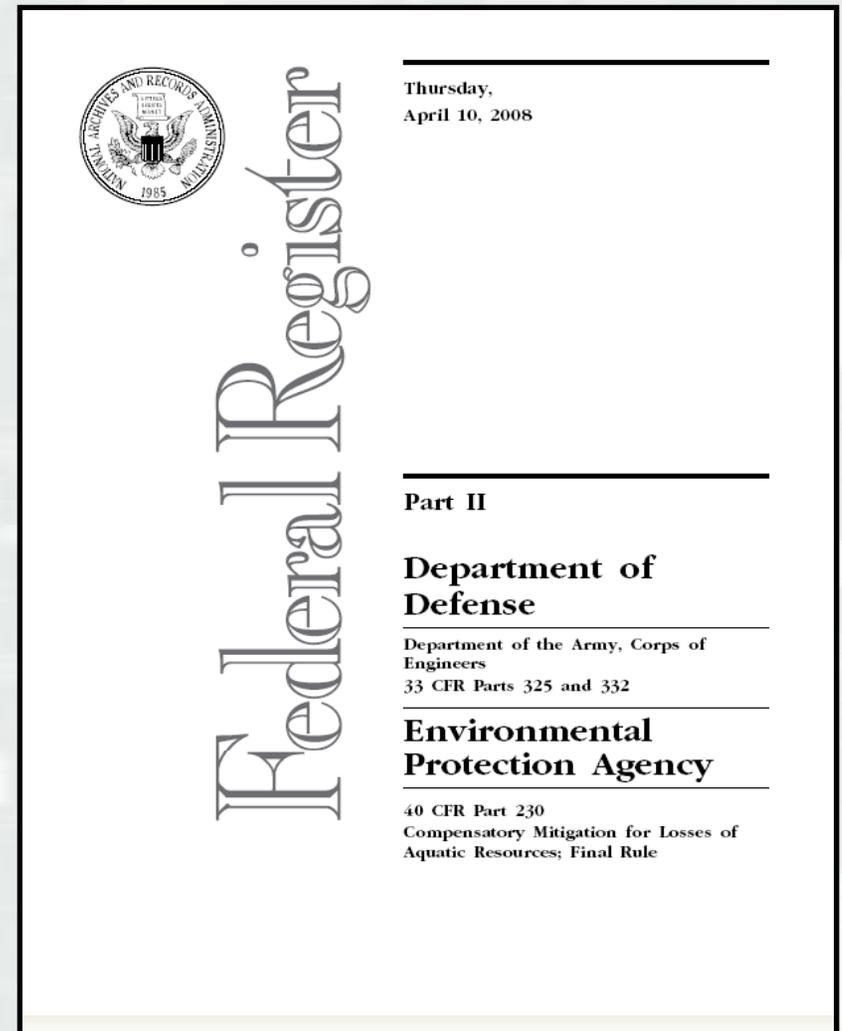


---

**BUILDING STRONG®**

# Off-Site Mitigation Options – KY ILF Program: Compliance w/2008 Rule – New Elements

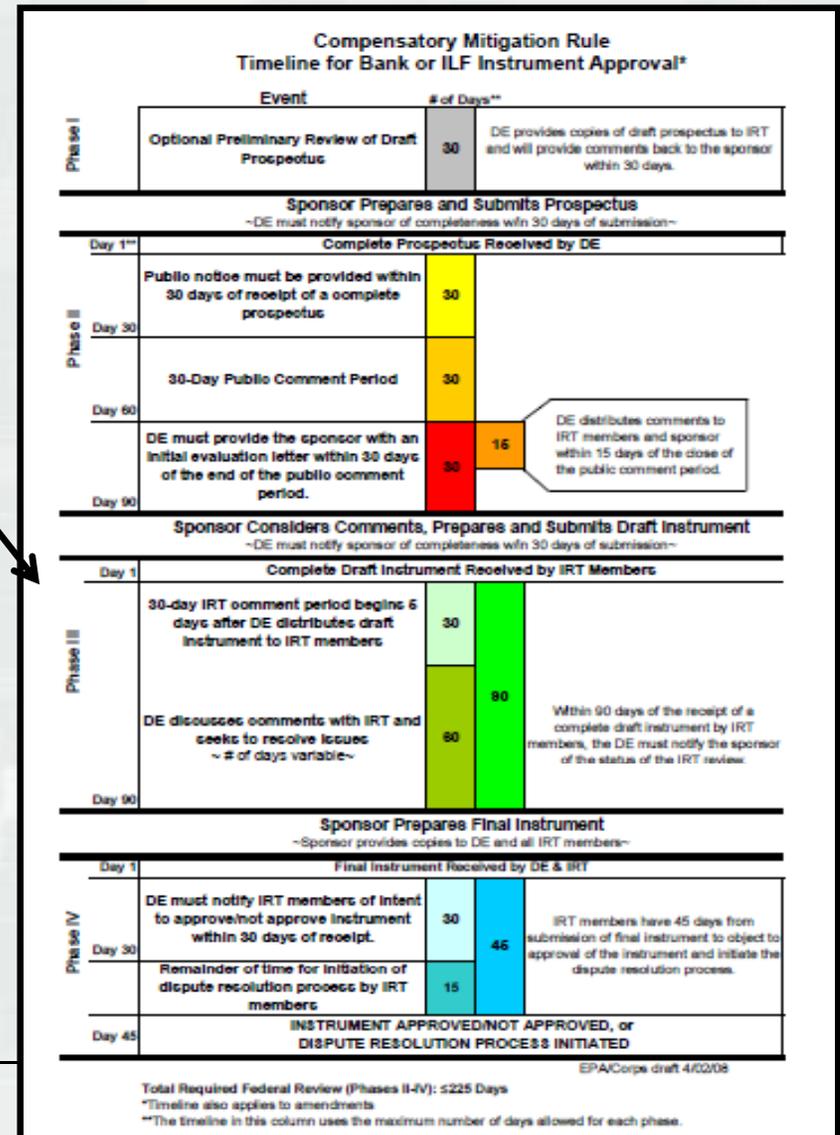
- Preference Hierarchy
- MRT = IRT
- ILF Programs “bank like”
- ILF Instruments (Umbrella)
  - ▶ Defines processes, roles, responsibilities
  - ▶ Compensation Planning Framework (CPF) – prioritization criteria, service areas
- Mitigation Plans – credit release schedule + performance measures
- *Project Approval – Instrument Mods*



# Off-Site Mitigation Options – KY ILF Program: Compliance w/2008 Rule – New Elements

## KDFWR ILF Instrument

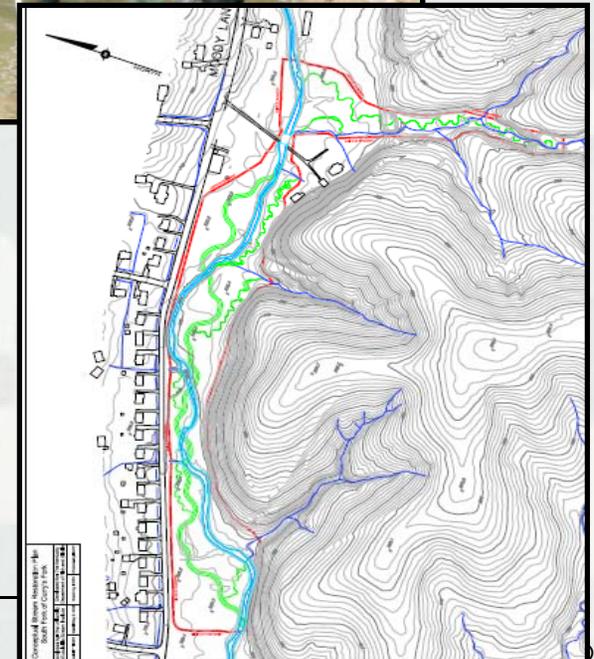
- Umbrella
- Draft Instrument/Phase III (~ 90 days)
- PN issued November 2010 (LRL-2010-325)
- Final Instrument Preparation



# Off-Site Mitigation Options – KY ILF Program: Compliance w/2008 Rule – New Elements

## Mitigation Plans

- 12+ Elements:
  - ▶ Objectives
  - ▶ Site selection
  - ▶ Baseline info.
  - ▶ Credit determination
  - ▶ Work plan
  - ▶ Maintenance plan
  - ▶ Performance standards
  - ▶ Monitoring requirements
  - ▶ Long-term mgt plan
  - ▶ Adaptive mgt
  - ▶ Financial assurances
  - ▶ Other (credit release schedule)



## Example Stream Success Criteria

Type/Category	Criteria	Initial Design Value	Year 1	Year 2	Year 3	Year 4	Final Value (after 5 years)
Geomorphological	Bank Erosion Hazard Index (BEHI)	Baseline Survey Values	Moderate (<30)	Moderate (<30)	Moderate (<30)	Moderate (<25)	Low (<20)
	Vertical Stability - Bank Height Ratio ( BHR)	"As-Built" Report	0.9-1.1	0.9-1.1	0.9-1.1	0.9-1.1	0.9-1.1
	Vertical Stability -Entrenchment Ratio ( ER)	"As-Built" Report	< 1.4 (+/- 0.2)	< 1.4 (+/- 0.2)	< 1.4 (+/- 0.2)	< 1.4 (+/- 0.2)	< 1.4 (+/- 0.2)
	Lateral Stability - Meander Width Ratio (MWR)	"As-Built" Report	< 5% change from constructed value	< 5% change from constructed value	< 5% change from constructed value	< 5% change from constructed value	< 5% change from constructed value
	Project Width/Depth ratio:Reference Width/Depth Ratio	"As-Built" Report & Reference Reach	1.0-1.2	1.0-1.2	1.0-1.2	1.0-1.2	1.0-1.2
	Stable Banks and Channel (assessed visually and documented photographically)	"As-Built" Report	No bank sloughing, head cuts, significant deposition, or significant instability	No bank sloughing, head cuts, significant deposition, or significant	No bank sloughing, head cuts, significant deposition, or significant	No bank sloughing, head cuts, significant deposition, or significant	No bank sloughing, head cuts, significant deposition, or significant instability
	Pebble Counts (400) in point bars and riffles	Pre-Construction/ Initial Design Value			in point bars and riffles		400 pebble count in point bars and riffles
	Bankfull (or greater) Flow Events (Cumulative)		A minimum of three bankfull (or greater) flow events within five year monitoring period				
Hydrological/Stream Flow	Stream Flow Type (ephemeral, intermittent, perennial) as documented in JD		Consistent with JD	Consistent with JD	Consistent with JD	Consistent with JD	Consistent with JD
Habitat	RBP Scores	Predicted RBP score of Average or Excellent	Average - Excellent		Average - Excellent		Average - Excellent
Vegetation	<b>RPM 3-gallon trees:</b>						
	stems per acre		54	54	54	54	54
	survivorship		90%	90%	90%	90%	90%
	max # any species		25%	25%	25%	25%	25%
	max % invasive woody species		0	0	0	0	0
max # volunteer trees	"As-Built" Report	0	0	0	0	0	
<b>Herbaceous Vegetation:</b>							
percent ground cover		70%	70%	70%	70%	70%	
max # any species		40%	40%	40%	40%	40%	
max % invasive species	"As-Built" Report	10%	10%	10%	10%	10%	
<b>Maximum % Kudzu</b>			0%	0%	0%	0%	
<b>Species List</b> (Scientific & Common Name, Wetland Status Indicator, Native vs. Non-Native vs. Invasive)	"As-Built" Report		Provide list by planting zone	Provide list by planting zone	Provide list by planting zone	Provide list by planting zone	Provide list by planting zone
Biotic	Fish Index (KIBI for KY)	Baseline Survey Values	N/A	≥ 31	N/A	N/A	≥ 52
	Macroinvertebrate Index (MBI for KY)	Baseline Survey Values	N/A	≥ 39	N/A	N/A	≥ 58

# Off-Site Mitigation Options – KY ILF Program

## Compliance with the Mitigation Rule

- Transition Issues

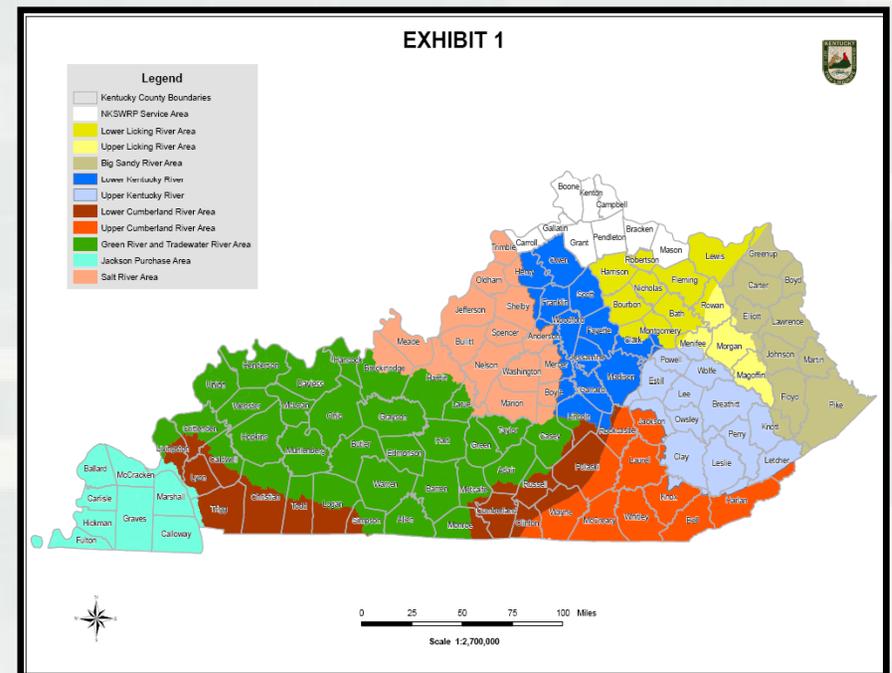
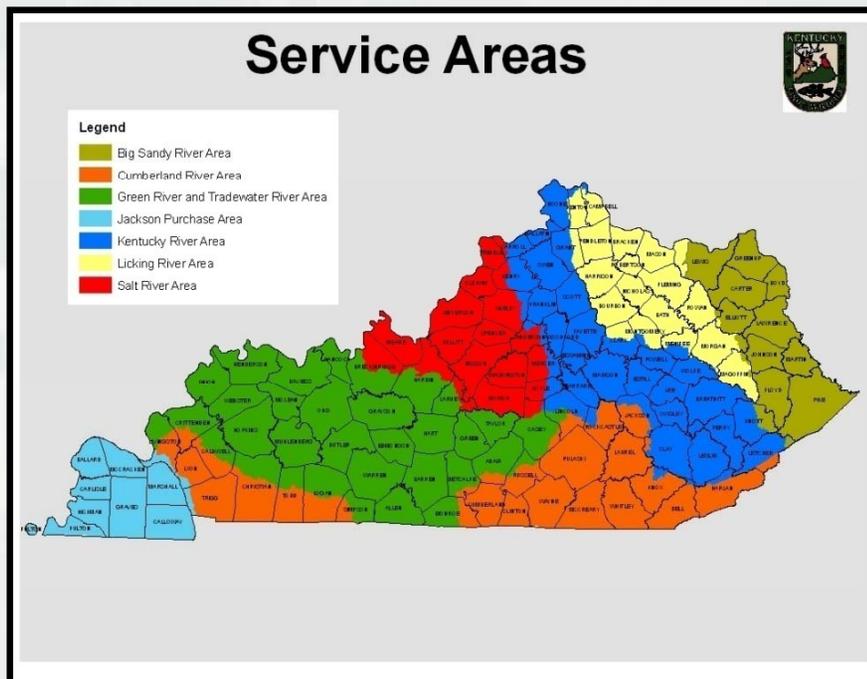


---

**BUILDING STRONG®**

# Off-Site Mitigation Options – KY ILF Program: Compliance w/2008 Rule – Transition

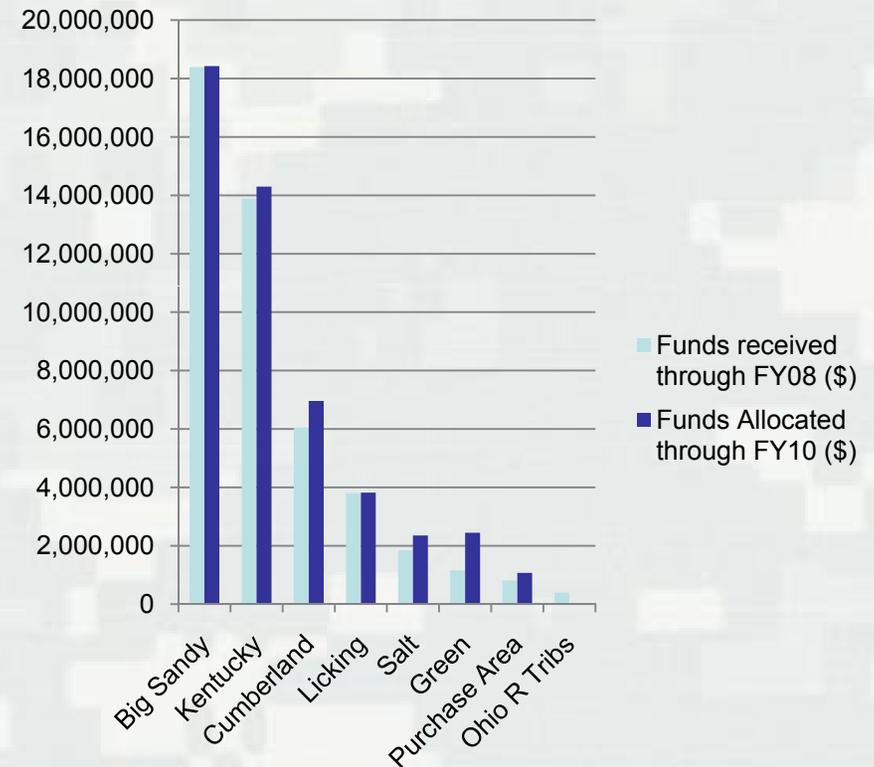
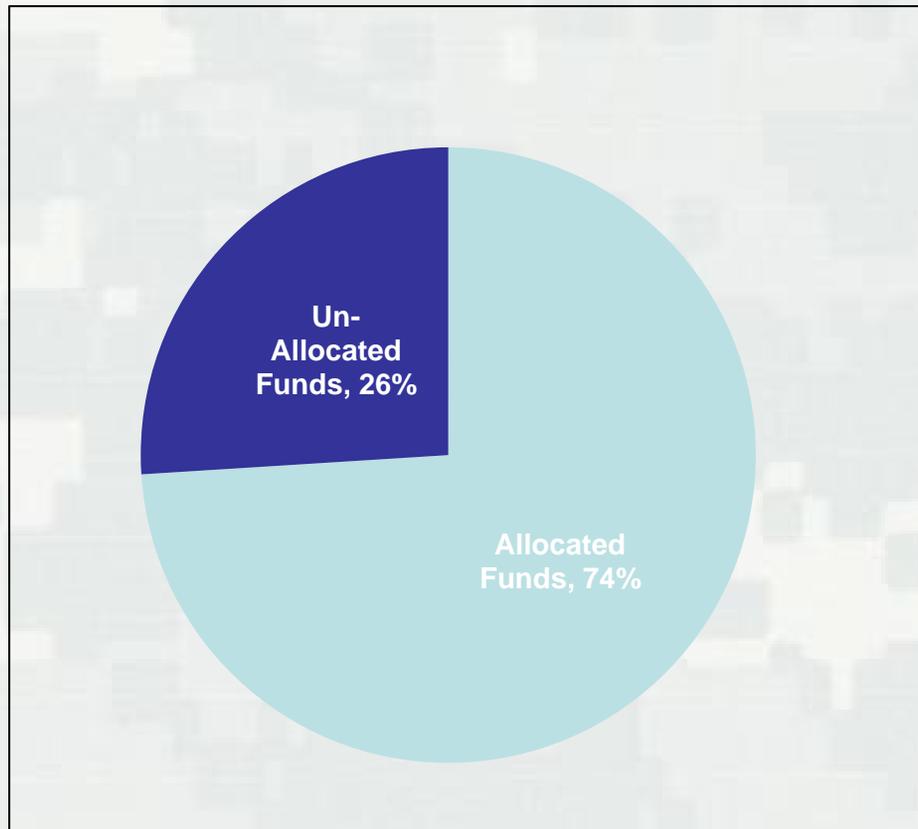
- 7 Service Areas
- ~ 6 Digit HUCs
- Crosses ecoregions
- 10 Service Areas
- ~ 8+ Digit HUCs
- Separates ecoregions



# Off-Site Mitigation Options – KY ILF Program: Compliance w/2008 Rule – Transition

## 3 Yr Delivery

- Allocation of Funds



# Off-Site Mitigation Options – KY ILF Program: Compliance w/2008 Rule – Transition

## 3 Yr Delivery



Admin  
24 mos.

Begin  
**CREDIT SALES \$\$**

3- Year Delivery [Service Area Funds]  
up to 36 mos.

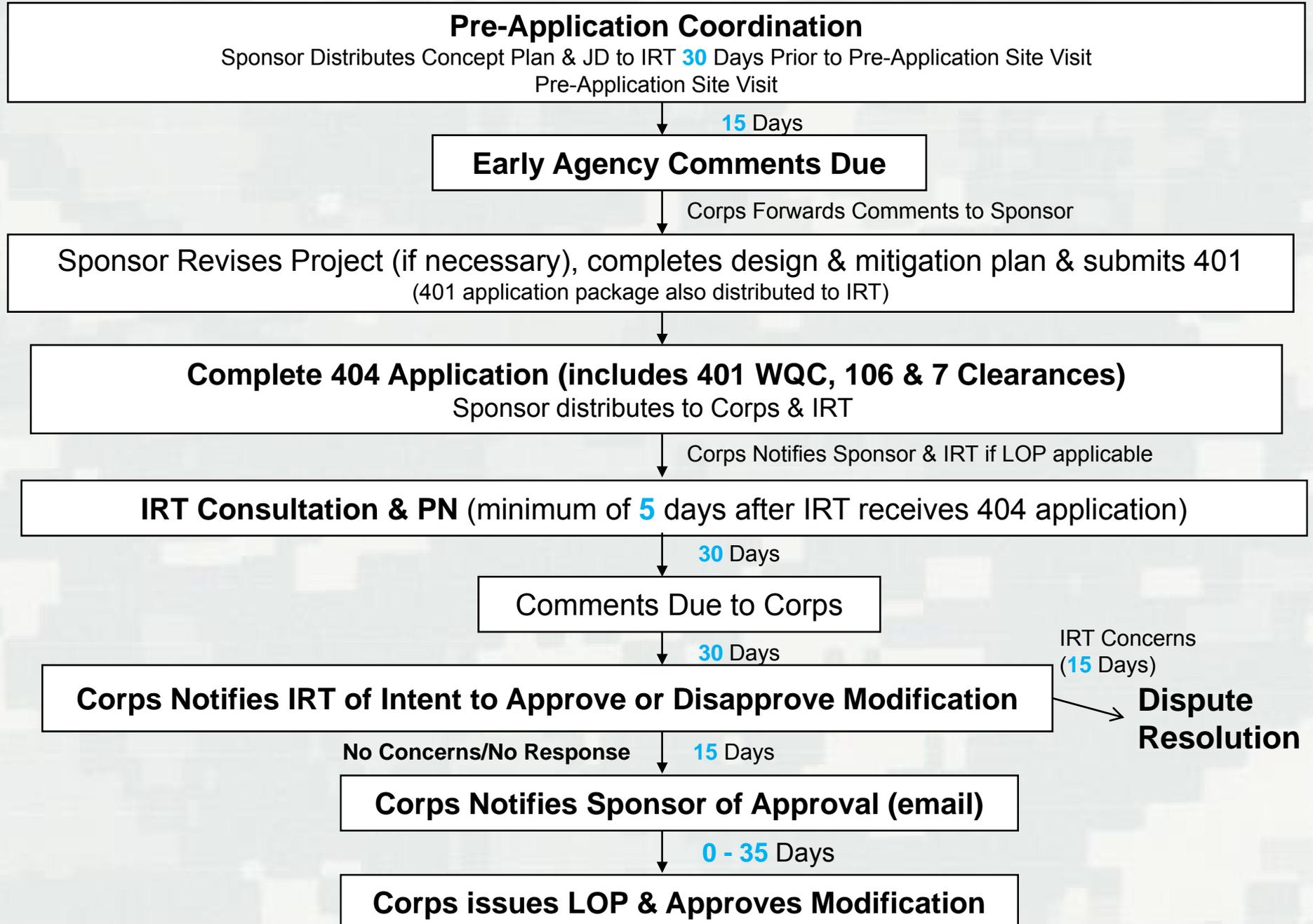
- Project Id
- Concept Plan
- Title Review
- Survey
- Easement/Purchase

- Design
- Permits
- Construction
- Plant



**BUILDING STRONG®**

# Project Approval Process



# Off-Site Mitigation Options – KY ILF Program

- History, Overview
- Compensation for Impacts in the Appalachian region
- Existing Challenges
- Compliance with the Mitigation Rule
  - New Elements
  - Transition Issues (3 Yr Delivery, Project Approval)



# Questions?

[patti.g.jarrett@usace.army.mil](mailto:patti.g.jarrett@usace.army.mil)

<http://www.lrl.usace.army.mil/>



---

**BUILDING STRONG®**